Title (en)
METHODS AND SYSTEMS FOR GENERATING END-TO-END MODEL TO ESTIMATE 3-DIMENSIONAL(3-D) POSE OF OBJECT

Title (de)
VERFAHREN UND SYSTEME ZUR ERZEUGUNG EINES END-ZU-END-MODELLS ZUR SCHÄTZUNG DER DREIDIMENSIONALEN LAGE EINES OBJEKTS

Title (fr)
PROCÉDÉS ET SYSTÈMES DE GÉNÉRATION DE MODÈLE DE BOUT EN BOUT POUR ESTIMER LA POSE TRIDIMENSIONNELLE (3-D) D'OBJET

Publication
EP 4009277 A1 20220608 (EN)

Application
EP 21211210 A 20211130

Priority
IN 202021052798 A 20201203

Abstract (en)
The present disclosure herein provides methods and systems that solves the technical problems of generating an efficient, accurate and light-weight 3-Dimensional (3-D) pose estimation framework for estimating the 3-D pose of an object present in an image used for the 3-dimensional (3D) model registration using deep learning, by training a composite network model with both shape features and image features of the object. The composite network model includes a graph neural network (GNN) for capturing the shape features of the object and a convolution neural network (CNN) for capturing the image features of the object. The graph neural network (GNN) utilizes the local neighbourhood information through the image features of the object and at the same time maintaining global shape property through the shape features of the object, to estimate the 3-D pose of the object.

IPC 8 full level
G06T 7/73 (2017.01); **G06K 9/62** (2022.01)

CPC (source: EP US)
G06T 7/55 (2017.01 - US); **G06T 7/75** (2017.01 - EP US); **G06V 10/426** (2022.01 - EP); **G06V 10/82** (2022.01 - EP); **G06V 20/64** (2022.01 - EP); G06T 2207/10024 (2013.01 - EP US); G06T 2207/20081 (2013.01 - EP US); G06T 2207/20084 (2013.01 - EP US)

Citation (applicant)
- Y XIANGR MOTTAGHIS SAVARESE: "IEEE WACV", 2014, IEEE, article "Beyond pascal: A benchmark for 3d object detection in the wild", pages: 75 - 82
- YANG XIAOXUCHONG QIUPIERRE-ALAIN LANGLOISMATHIEU AUBRYRENAUD MARLET: "Pose from Shape: Deep Pose Estimation for Arbitrary 3D Objects", ARXIV:1906.05105, 2019
- KAIMING HEXIANGYU ZHANGSHAOQING RENJIAN SUN: "Deep residual learning for image recognition", PROCEEDINGS OF THE IEEE CVPR, 2016, pages 770 - 778, XP055536240, DOI: 10.1109/CVPR.2016.90

Citation (search report)
- [X] DANI MEGHAL ET AL: "PoseFromGraph: Compact 3-D Pose Estimation using Graphs", EXTENDED ABSTRACTS OF THE 2021 CHI CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS, ACMPUB27, NEW YORK, NY, USA, 1 December 2020 (2020-12-01), pages 1 - 4, XP058554066, ISBN: 978-1-4503-8095-9, DOI: 10.1145/3410700.3425433
- [A] TA-CHIH LEE ET AL: "BUILDING SKELETON MODELS VIA 3-D MEDIAL SURFACE/AXIS THINNING ALGORITHMS", CVGIP GRAPHICAL MODELS AND IMAGE PROCESSING, ACADEMIC PRESS, DULUTH, MA, US, vol. 56, no. 6, 1 November 1994 (1994-11-01), pages 462 - 478, XP000546673, ISSN: 1077-3169
- [A] YANG XIAO ET AL: "Pose from Shape: Deep Pose Estimation for Arbitrary 3D Objects", ARXIV.ORG, CORNELL UNIVERSITY LIBRARY, 201 OLIN LIBRARY CORNELL UNIVERSITY ITHACA, NY 14853, 12 June 2019 (2019-06-12), XP081455068
- [A] AO LUO ET AL: "Cascade Graph Neural Networks for RGB-D Salient Object Detection", ARXIV.ORG, CORNELL UNIVERSITY LIBRARY, 201 OLIN LIBRARY CORNELL UNIVERSITY ITHACA, NY 14853, 7 August 2020 (2020-08-07), XP081735818

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

DOCDB simple family (publication)
EP 4009277 A1 20220608; US 2022222852 A1 20220714

DOCDB simple family (application)
EP 21211210 A 20211130; US 202117537805 A 20211130